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Cao

15. (Amended) The liquid crystal display element of claim 14, wherein the optical axis of a *batonnet* deposited from said first substrate is substantially coincident with the optical axis of a *batonnet* deposited from said second substrate.

IN THE DRAWINGS:

Subject to the approval of the Examiner, please accept amended Fig. 7(a) as outlined in the Request for Approval of Drawing Change, filed herewith.

REMARKS

By this amendment, claims 8, 14, and 15 have been amended to more appropriately claim the invention. The subject matter of claims 12 and 13 has been incorporated into independent claim 8. The changes made are shown in the Appendix to the Amendment of August 17, 2002, filed herewith.

In the Office Action, claims 14-18 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In the instant Amendment, Applicants have amended claim 14 to more accurately claim the invention and respectfully submit that the amendment overcomes the 35 U.S.C. § 112, first paragraph, rejection. Because claims 15-18 depend from claim 14, Applicants submit that these claims also comply with § 112, first paragraph.

Claims 8 and 9 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 5,936,689 to Saishu. Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as being anticipated by Tanaka JP 04-371925. Claims 3-7 were rejected under

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35 U.S.C. § 103(a) as being unpatentable over Tanaka as applied to claims 1 and 2 in view of U.S. Patent 5,686,019 to Nakamura. Claims 10 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Saishu as applied to claim 8 in view of Tanaka. Claims 12 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Saishu as applied to claim 8 in view of Tanaka in further view of Nakamura.

Rejection of Claims 8 and 9 Under 35 U.S.C. §102(e)

The Examiner alleges that Saishu discloses all limitations of claims 8 and 9. However, Saishu does not teach or suggest that the surface tension of each of the first and second alignment layers is between about 49 dyn/cm and about 53 dyn/cm 0.9, as recited in amended claim 8. Accordingly, Applicants submit that claim 8 is allowable. Because claim 9 depends from claim 8, Applicants submit that claim 9 is allowable for at least the same reasons as claim 8.

Rejections Under 35 U.S.C. §103(a)

The rejection of claims 1-7, 10, and 11 is respectfully traversed, since a *prima facie* case of obviousness has not been made by the Examiner.

To establish a *prima facie* case of obviousness under 35 U.S.C. § 103, each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element recited in the claims. (See M.P.E.P. § 2143.01 (8th ed. 2001)). Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available

to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of these requirements must "be found in the prior art, and not based on Applicant's disclosure." (M.P.E.P. § 2143 (8th ed. 2001)).

Rejection of Claims 1 and 2 Under 35 U.S.C. §103(a) Over Tanaka

In the Office Action, the Examiner rejected claims 1 and 2 under 35 U.S.C. § 103(a) but stated that the claims are *anticipated* by Tanaka. Anticipation is the standard applied to 35 U.S.C. § 102. Respectfully, Tanaka does not anticipate or render obvious claims 1 and 2 because Tanaka does not teach or suggest each and every limitation of claims 1 and 2, as discussed below.

The Examiner alleges that Tanaka discloses all of the features of claim 1 except that the first and second alignment layers are combined with the liquid crystal material so that a shifted angle between the extending direction and quenching direction of a *batonnet* is within ± 1 degree. However, the Examiner alleges that Figure 3 of the application shows the shifted angle between the extending direction and an optical axis of a *batonnet*, $(\theta_{OA}-\theta_B)$, is within ± 1 degree for all examples where the angle of the optical axis is less than 7 degrees (half the 14 degree angle between the rubbing directions). The Examiner states that Tanaka's angle between the rubbing directions is 6.8 degrees, less than 14 degrees, so the resulting shifted angle between the extending direction and the optical axis of a *batonnet* will be within ± 1 degree.

Applicants respectfully disagree with the Examiner's analysis. Tanaka discloses a liquid crystal electro-optical element in which the longitudinal direction (extending

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direction) and optical axis of the liquid crystal are identical. Indeed, Tanaka does not teach or suggest that first and second alignment layers are combined with the liquid crystal material such that the angle between the extending direction and the optical axis of a *batonnet* is shifted. Rather, Tanaka focuses on rubbing directions, which are not the same as extending directions or quenching directions. This is in contrast to claim 1, which recites that the shifted angle between the extending direction and the quenching direction of a *batonnet* is within ± 1 degree.

Accordingly, Applicants submit that claim 1 is patentable over Tanaka. In addition, because claim 2 depends from claim 1, Applicants submit that claim 2 is allowable for at least the same reason as claim 1.

Rejection of Claims 3-7 Under 35 U.S.C. §103(a) Over Tanaka in view of Nakamura

Claims 3-4 depend from claim 1. Nakamura does not cure the deficiencies of Tanaka as applied to claim 1. Therefore, Applicants submit that claims 3-4 are allowable for at least the same reason as claim 1.

In addition, Nakamura fails to teach, *inter alia*, that the first and second alignment layers have a surface tension of about 49 dyn/cm to about 53 dyn/cm, as recited in claims 3 and 4. Nakamura teaches the condition that $\gamma_1 > \gamma_2$, where γ_1 is the surface energy of a first substrate and γ_2 is the surface energy of the second substrate, and where γ is measured in dyn/cm. See col. 5, lines 35-43. Nakamura also requires that $\gamma_1 - \gamma_2 > 9$ and preferably that $\gamma_1 - \gamma_2 > 17$. See col. 6, lines 1-4. In each example disclosed by Nakamura, the first and second alignment layers do not have a surface energy of about 49 dyn/cm to about 53 dyn/cm. At best, in Nakamura, only one of the alignment

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layers has a surface energy falling in the claimed range. Specifically, the surface energies for the first and second alignment layers disclosed by Nakamura are shown in Table 2, a portion of which is reproduced as follows:

Example Number	1 st substrate (dyn/cm)	2 nd substrate (dyn/cm)
Ex. 1	50	30
Ex. 2	50	23
Ex. 3	50	33
Ex. 4	50	48
Ex. 5	50	55
Ex. 6	50	41
Ex. 7	46	30
Ex. 8	48	30
Ex. 9	49	30
Ex. 10	51	30

Therefore, Nakamura does not teach or suggest that the first and second alignment layers have a surface tension of about 49 dyn/cm to about 53 dyn/cm, as recited in claims 3 and 4.

Claims 5-7 depend from claim 1. Nakamura does not cure the deficiencies of Tanaka as applied to claim 1. Therefore, Applicants submit that claims 5-7 are allowable for at least the same reason as claim 1. In addition, claim 7 further depends from claim 3, which was shown above to be distinguishable over Tanaka in view of Nakamura. As such, Applicants submit that claim 7 is also allowable for at least the same reason as claim 3.

Rejection of Claims 10-11 Under 35 U.S.C. §103(a) Over Saishu in view of Tanaka

Claims 10-11 depend from claim 8, which recites, *inter alia*, that the surface tension of each of said first and second alignment layers is between about 49 dyn/cm and about 53 dyn/cm. Neither Saishu nor Tanaka teach or suggest this limitation. As

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such, Applicants submit that claims 10-11 are allowable for at least the same reasons as claim 8.

In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration of this application and the allowance of the pending claims.

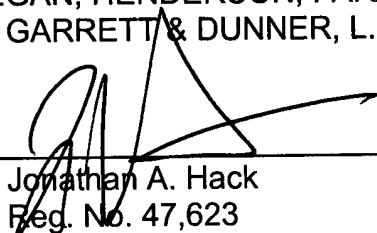
Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
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Dated: August 19, 2002

By: _____


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APPENDIX TO AMENDMENT OF AUGUST 19, 2002

Version with Markings to Show Changes Made

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Amendments to the Claims

8. (Amended) A liquid crystal display element comprising:

a first substrate;

a second substrate counter to said first substrate;

a switching element disposed on said first substrate;

a first alignment layer formed over said switching element;

a second alignment layer formed over said second substrate, wherein said first and second alignment layers are rubbed in rubbing directions;

a light modulating layer disposed between said first and second substrates wherein the light modulating layer comprises an anti-ferroelectric liquid crystal material having a thresholdless voltage-transmittance characteristic; and

a filter formed on said second substrate, wherein said filter allows specific wavelengths of light to pass,

wherein the surface tension of each of said first and second alignment layers is between about 49 dyn/cm and about 53 dyn/cm.

14. (Amended) A liquid crystal display element comprising:

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a first substrate including, a first electrode formed on said first substrate, and a first alignment layer wherein said first alignment layer covers said first electrode;

a second substrate including, a second electrode formed on said second substrate, and a second alignment layer wherein said second alignment layer covers said second electrode; and

a light modulating layer of an anti-ferroelectric liquid crystal material between said first and second substrates and wherein said anti-ferroelectric liquid crystal material has a thresholdless voltage-transmittance characteristic,

wherein said first and second alignment layers are combined with said liquid crystal material so an angle between [the] an extending direction and [quenching direction] an optical axis of a *batonnet* is within about ± 1 degree.

15. (Amended) [A] The liquid crystal display element of claim 14, wherein the [quenching direction] optical axis of a *batonnet* deposited from said first substrate is substantially coincident with the [quenching direction] optical axis of a *batonnet* deposited from said second substrate.

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